

Economics 442

Macroeconomic Policy

Lecture 7
9/28/2020

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UW Madison
Fall 2020

Outline

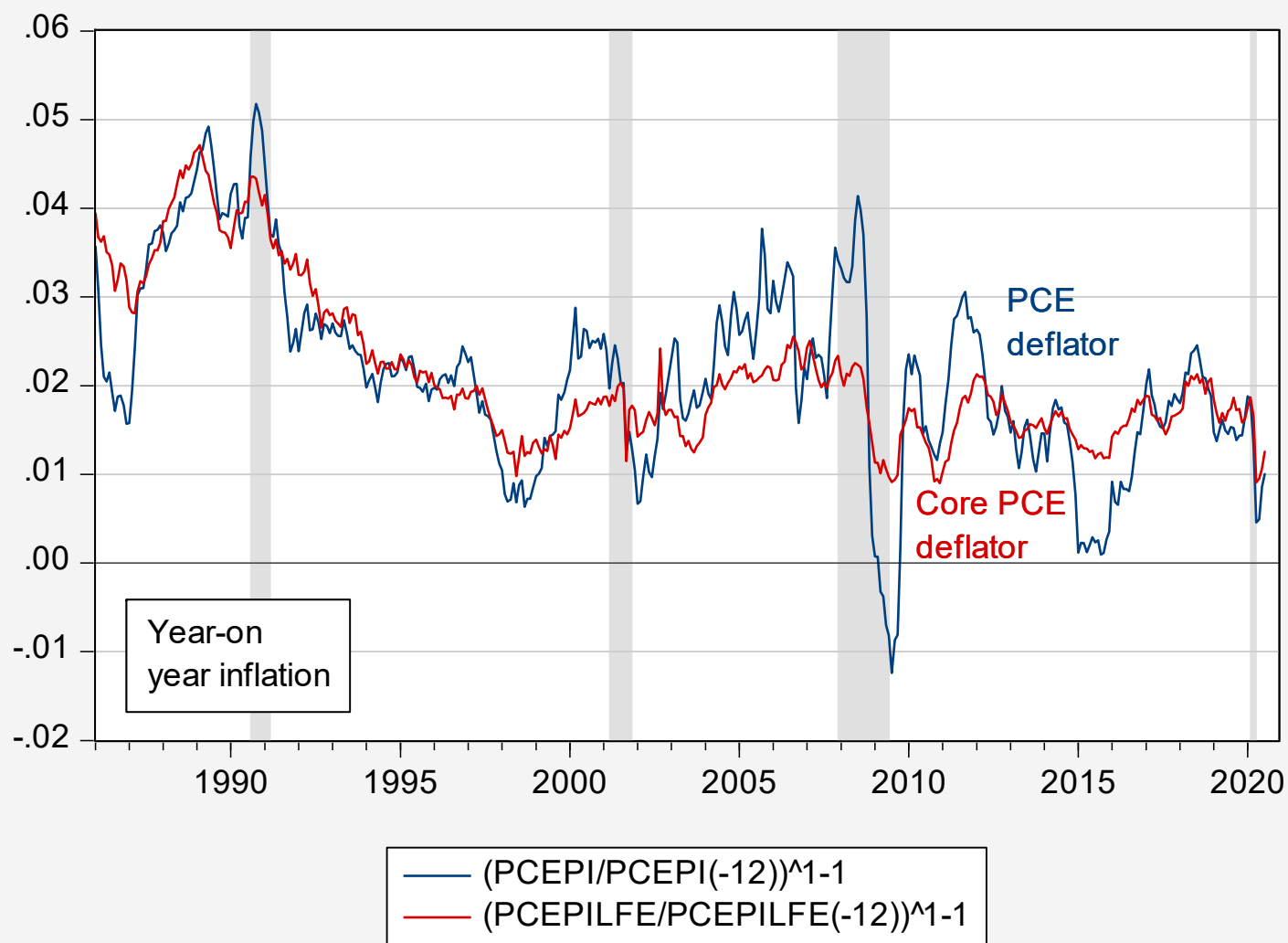
- Recap and Elaboration AD-AS
- Unsustainable Policies
- Yet *More* Unsustainable Policies

Recap and Elaboration

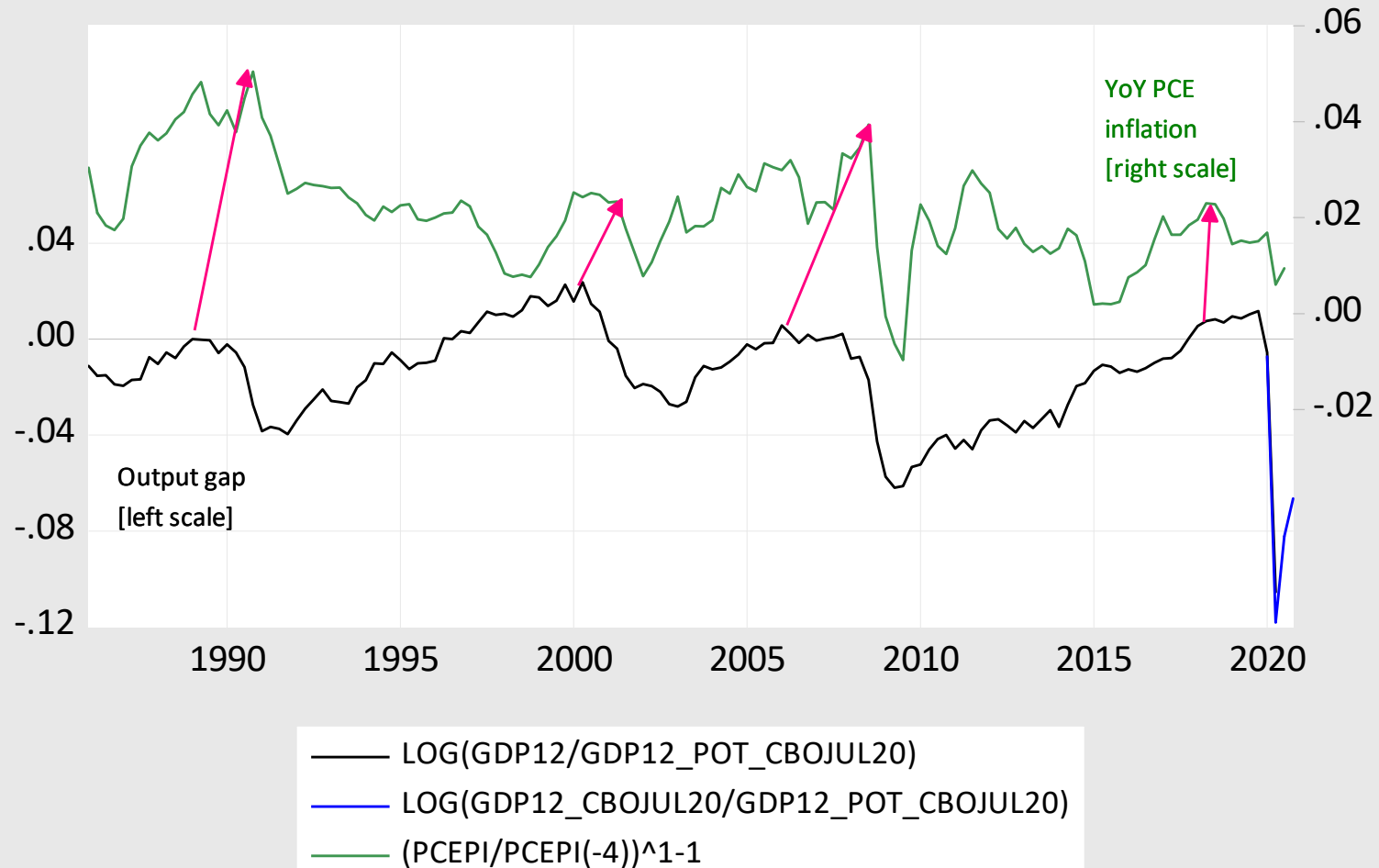
Limitations of IS-LM

- “Old fashioned” “Keynesian” in that price level is fixed
- Supply passively responds to demand
- Can dichotomize economy into real and financial sides
- We can fix first two...

Inflation Is Pretty Low



Systematic Movement in Price Level



What We Need

- A model that incorporates demand side
- But has price level rise faster when output exceeds what level the economy could produce utilizing factors of production at normal (“natural”) rates
- This level is called the natural rate of output (Y_n) or potential GDP, and the corresponding unemployment rate, the natural rate of unemployment (u_n).
- This is the AD-AS model

Model in Brief

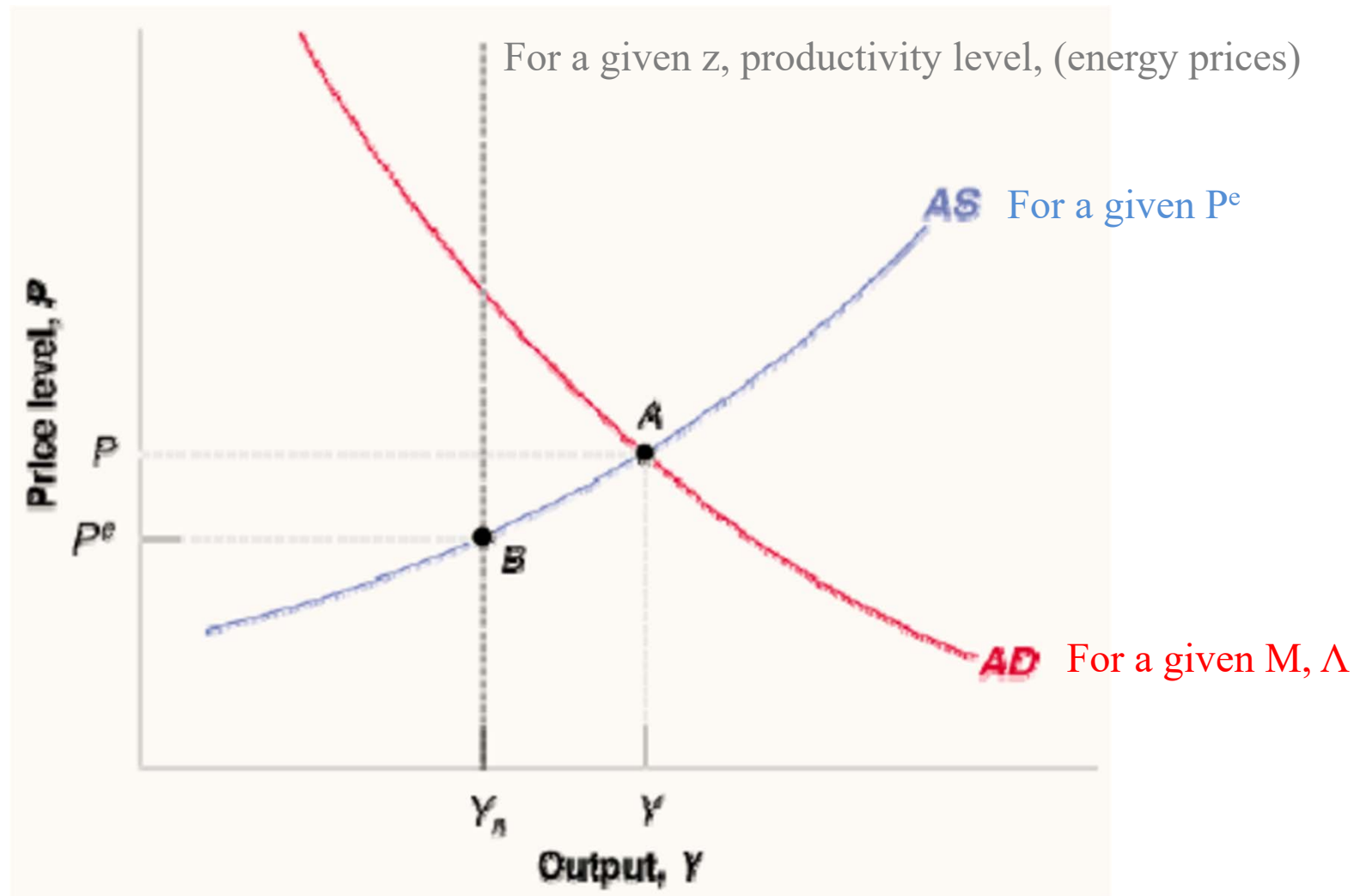
- Two equations (AD, AS)
- Expectations formation

$$Y = \hat{\gamma} \left[\Lambda_0 + \frac{b_2}{h} \left(\frac{M_0}{P} \right) - \frac{b_2 \mu_0}{h} \right]$$

$$P = P^e (1 + \mu) F \left(\left[1 - \frac{Y}{L} \right], z \right)$$

$$P^e = P_{-1}$$

Equilibrium, at Any Given Moment

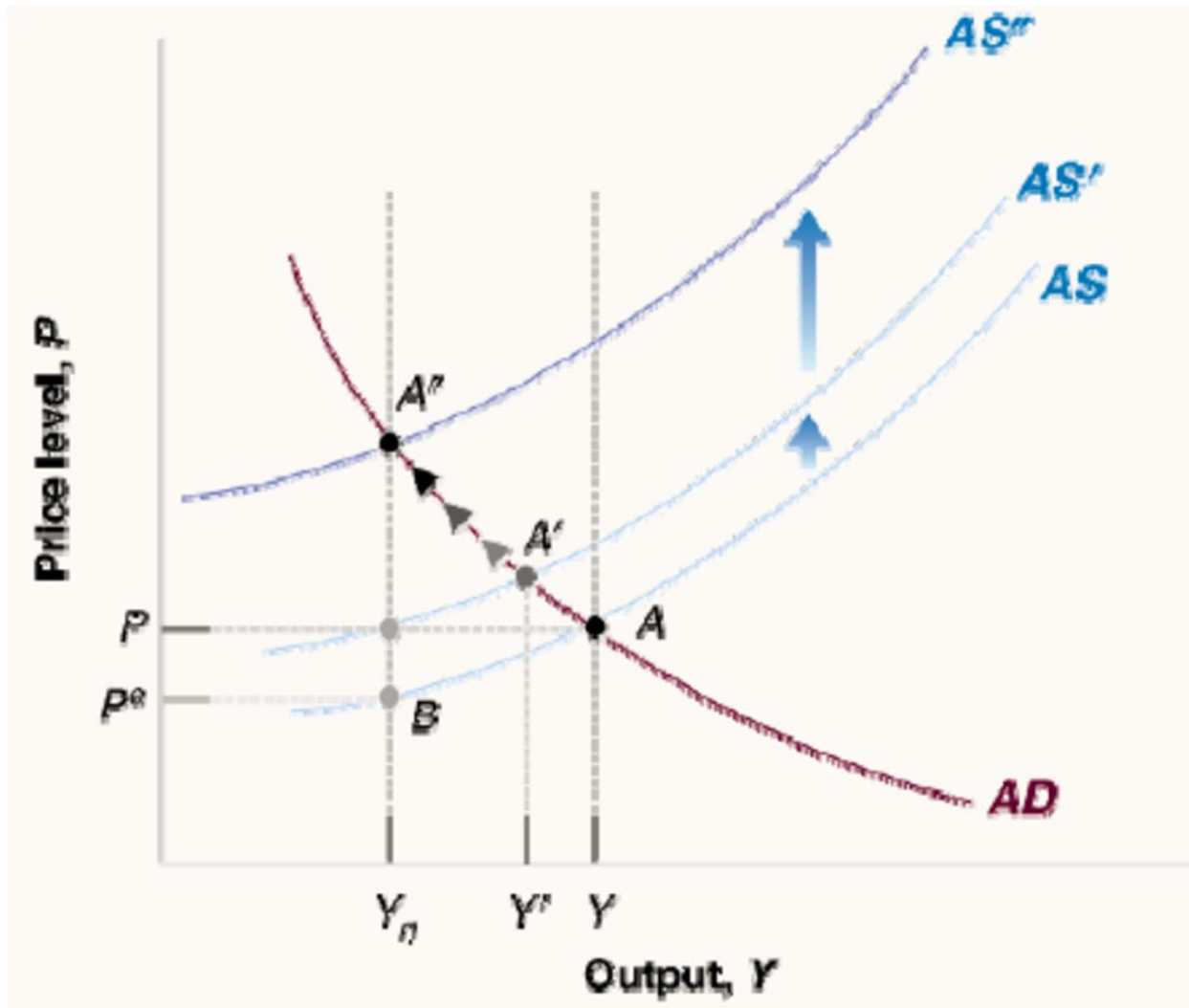


Notes: the AS always intersects the vertical curve at P^e

How Does the Economy Adjust over Time?

- Depends critically on P^e
- Many different possibilities
- Rational Expectations: $P = P^e + \text{random error}$
- Adaptive Expectations: $P^e = P_{-1}$

Adjustment over Medium Run with Adaptive Expectations



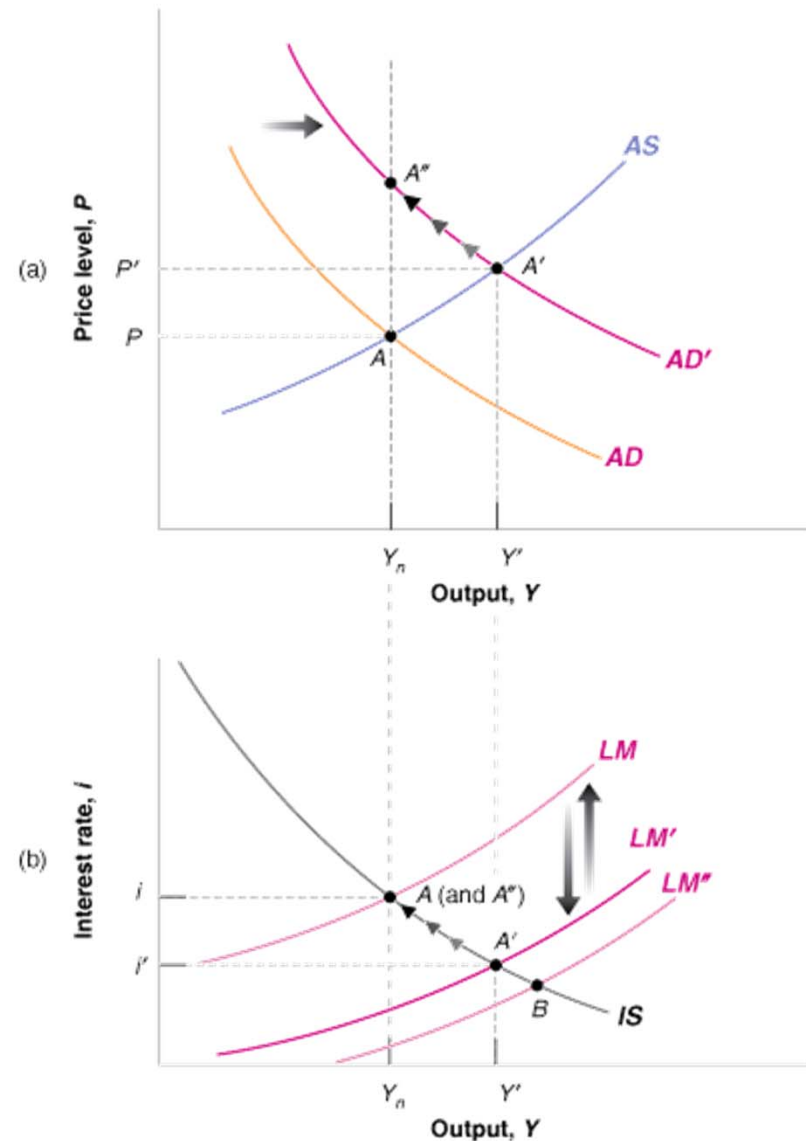
The Effects of a Monetary Expansion

Going Behind the Scenes

■ Figure 7 - 8

The Dynamic Effects of a Monetary Expansion on Output and the Interest Rate

The increase in nominal money initially shifts the LM curve down, decreasing the interest rate and increasing output. Over time, the price level increases, shifting the LM curve back up until output is back at the natural level of output.



The Effects of a Monetary Expansion

The Neutrality of Money

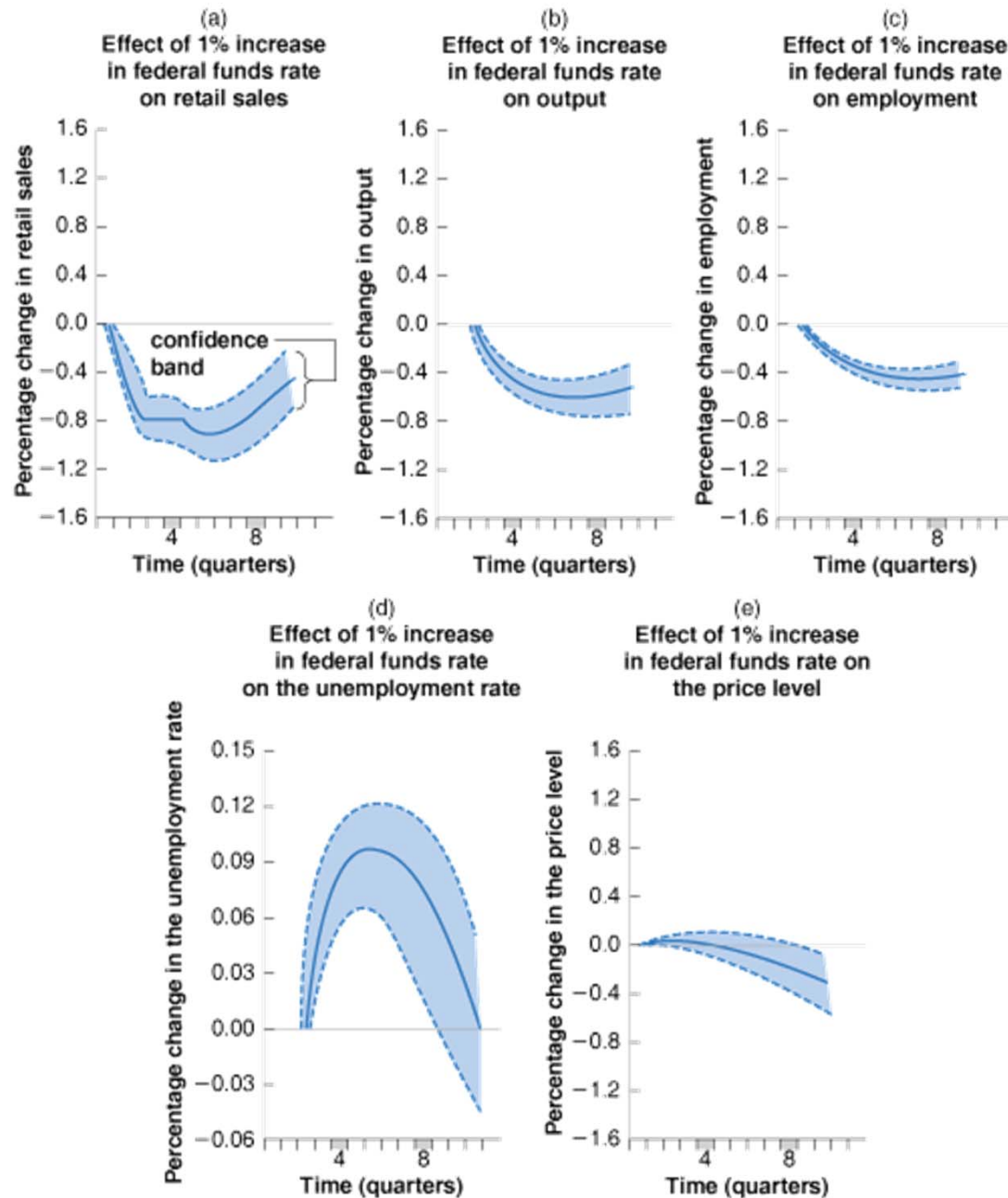
- In the *short run*, a monetary expansion leads to an increase in output, a decrease in the interest rate, and an increase in the price level.
- In the *medium run*, the increase in nominal money is reflected entirely in a proportional increase in the price level. The increase in nominal money has no effect on output or on the interest rate.
- The neutrality of money in the medium run does not mean that monetary policy cannot or should not be used to affect output.

How Does the *IS-LM* Model Fit the Facts?

Figure 5 - 9

The Empirical Effects of an Increase in the Federal Funds Rate

In the short run, an increase in the federal funds rate leads to a decrease in output and to an increase in unemployment, but it has little effect on the price level.



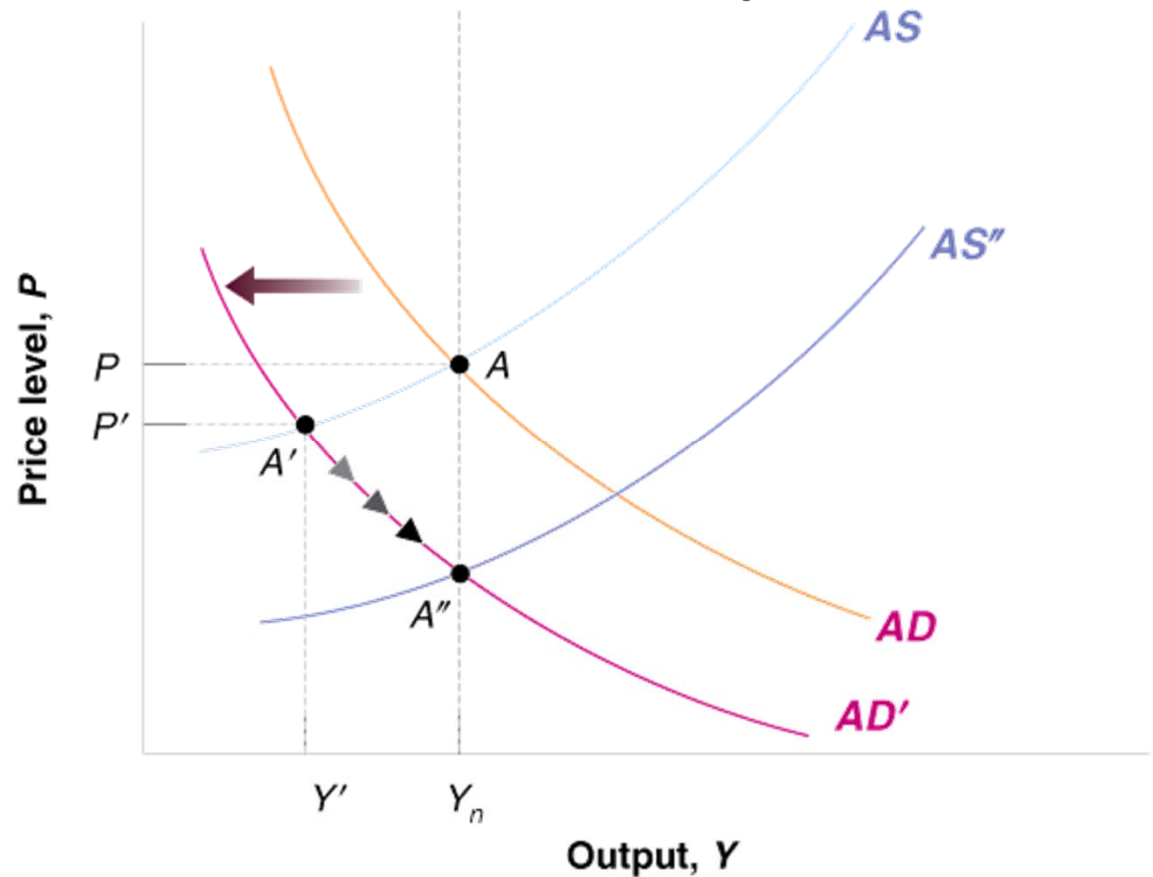
A Decrease in the Budget Deficit (No Portfolio Effects)

■ Figure 7 - 9

The Dynamic Effects of a Decrease in the Budget Deficit

A decrease in the budget deficit leads initially to a decrease in output. Over time, however, output returns to the natural level of output.

Note: This assumes no portfolio crowding out/in effects.

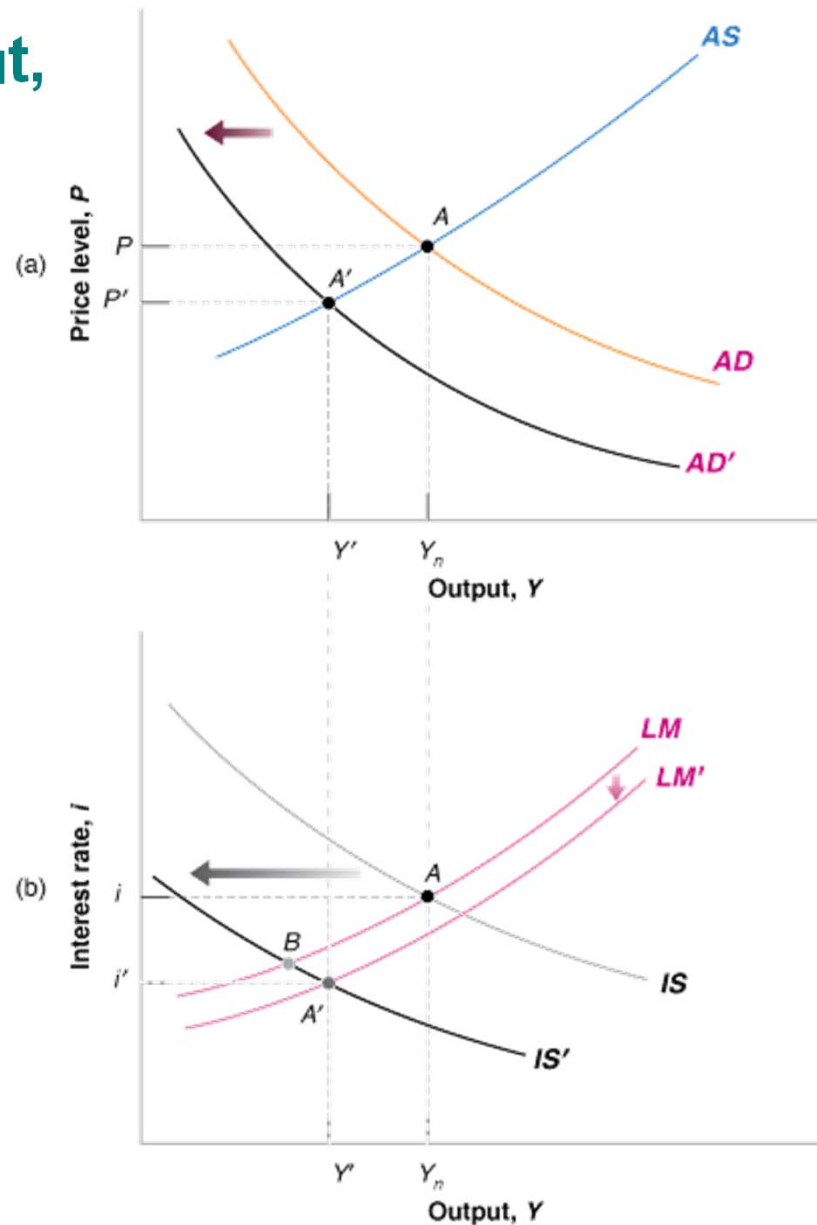


A Decrease in the Budget Deficit

Deficit Reduction, Output, and the Interest Rate

Since the price level declines in response to the decrease in output, the real money stock increases. This causes a shift of the LM curve to LM' .

Both output and the interest rate are lower than before the fiscal contraction.



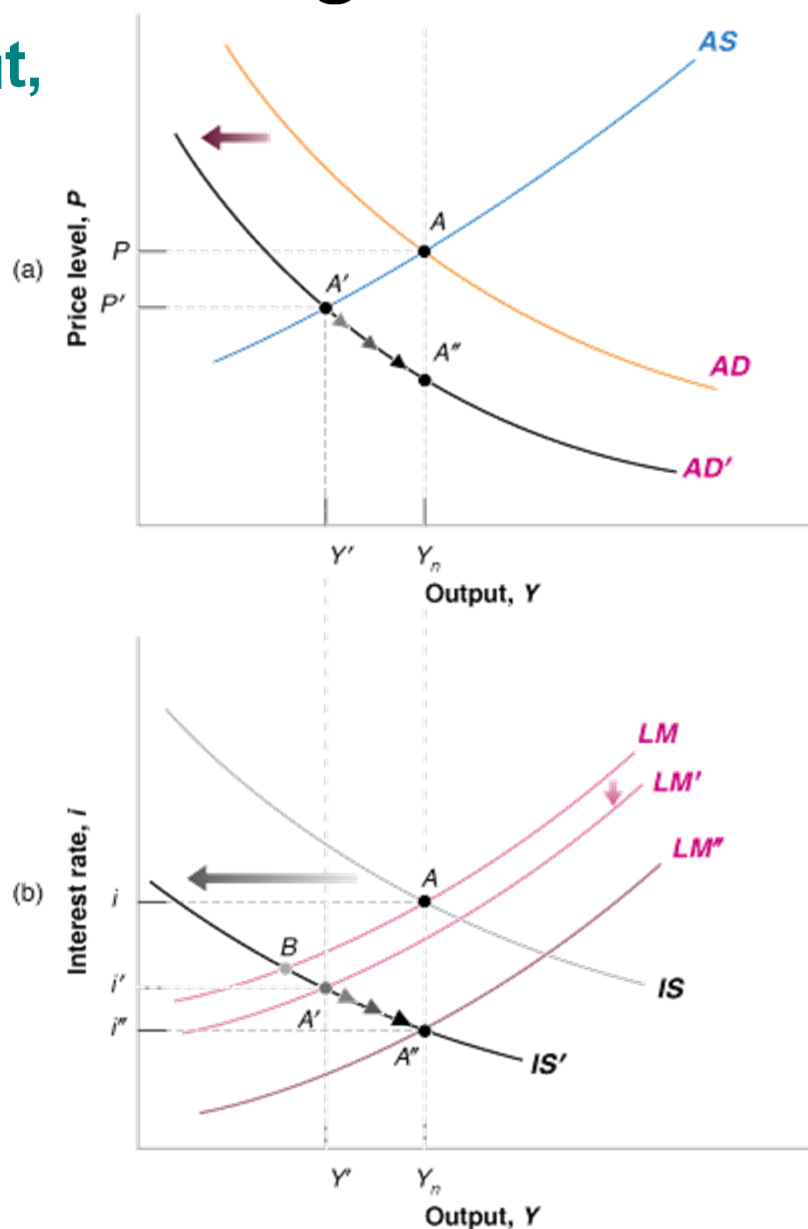
A Decrease in the Budget Deficit

Deficit Reduction, Output, and the Interest Rate

■ Figure 7 - 10

The Dynamic Effects of a Decrease in the Budget Deficit on Output and the Interest Rate

A deficit reduction leads in the short run to a decrease in output and to a decrease in the interest rate. In the medium run, output returns to its natural level, while the interest rate declines further.



A Decrease in the Budget Deficit

Deficit Reduction, Output, and the Interest Rate

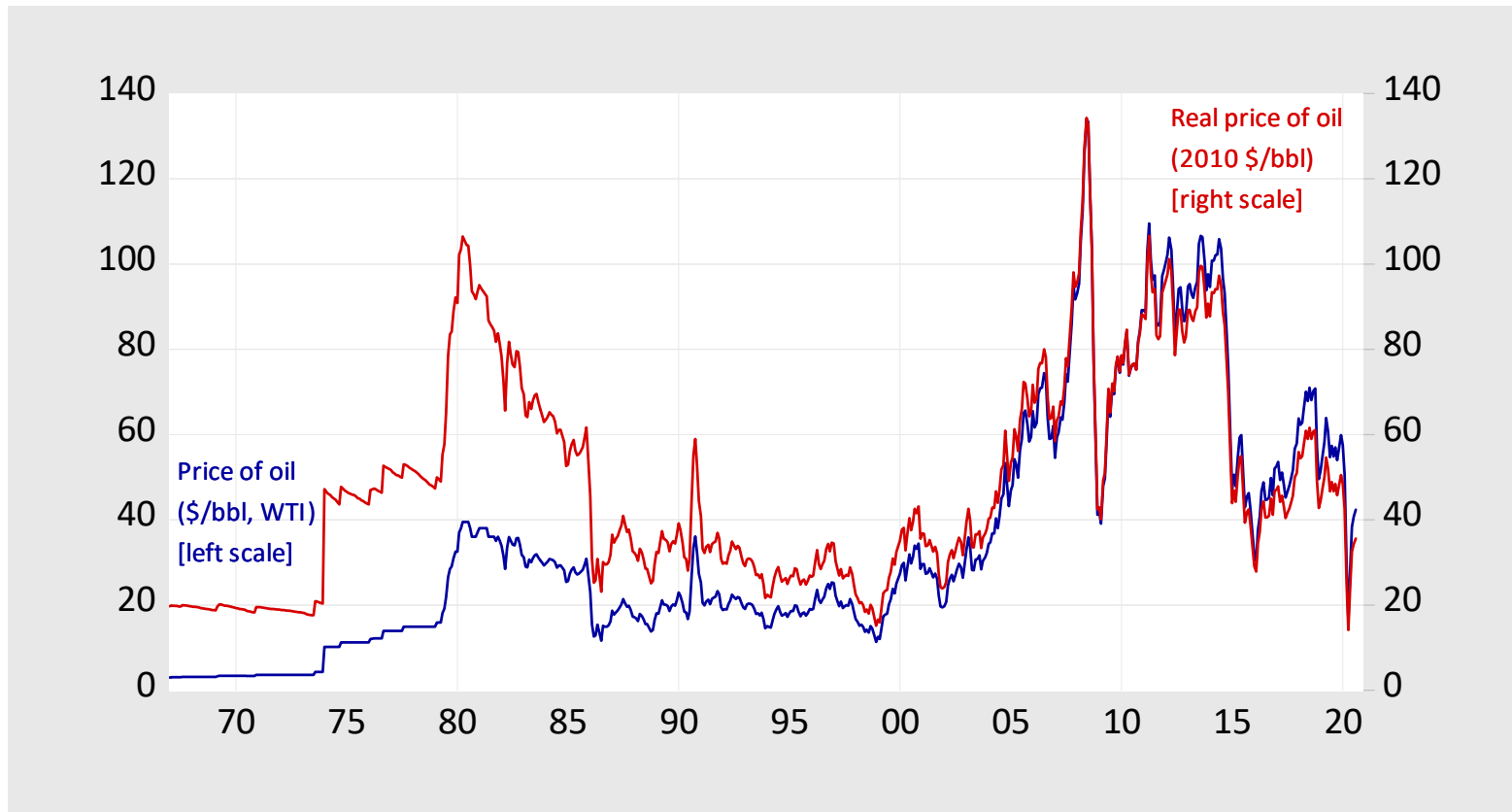
- The composition of output is different than it was before deficit reduction. Consider if deficit reduction is due to decrease in G :

$$IS \text{ relation: } Y_n = C(Y_n - T) + I(Y_n, i) + G$$

Income and taxes remain unchanged, thus, consumption is the same as before.

Government spending is lower than before; therefore, investment must be higher than before deficit reduction—higher by an amount exactly equal to the decrease in G .

Changes in the Price of Oil



Each of the two large price increases of the 1970s was associated with a sharp recession and a large increase in inflation—a combination macroeconomists call **stagflation**, to capture the combination of *stagnation* and *inflation* that characterized these episodes.

Changes in the Price of Oil

Effects on the Natural Rate of Unemployment

$$P = W(1 + \mu)$$

$$P = (1 + \mu)W^a P_E^{(1-a)}$$

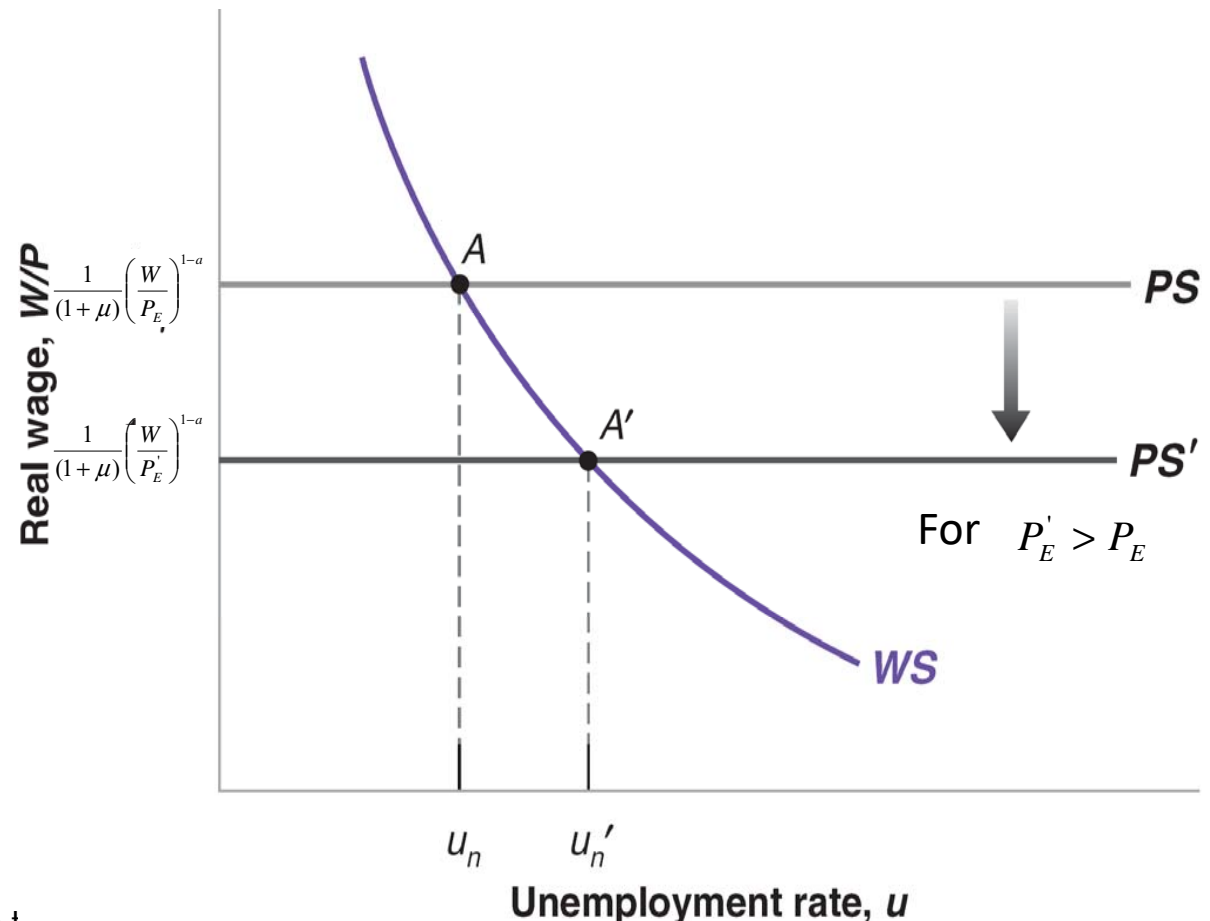
$$\frac{W}{P} = \frac{1}{(1 + \mu)} \left(\frac{W}{P_E} \right)^{1-a}$$

Figure 7 - 12

The Effects of an Increase in the Price of Oil on the Natural Rate of Unemployment

An increase in the price of oil leads to a lower real wage and a higher natural rate of unemployment.

[Note this is a slightly different treatment from in the textbook]



Changes in the Price of Oil

The Dynamics of Adjustment

$$P = (1 + \mu)W^a P_E^{(1-a)}$$

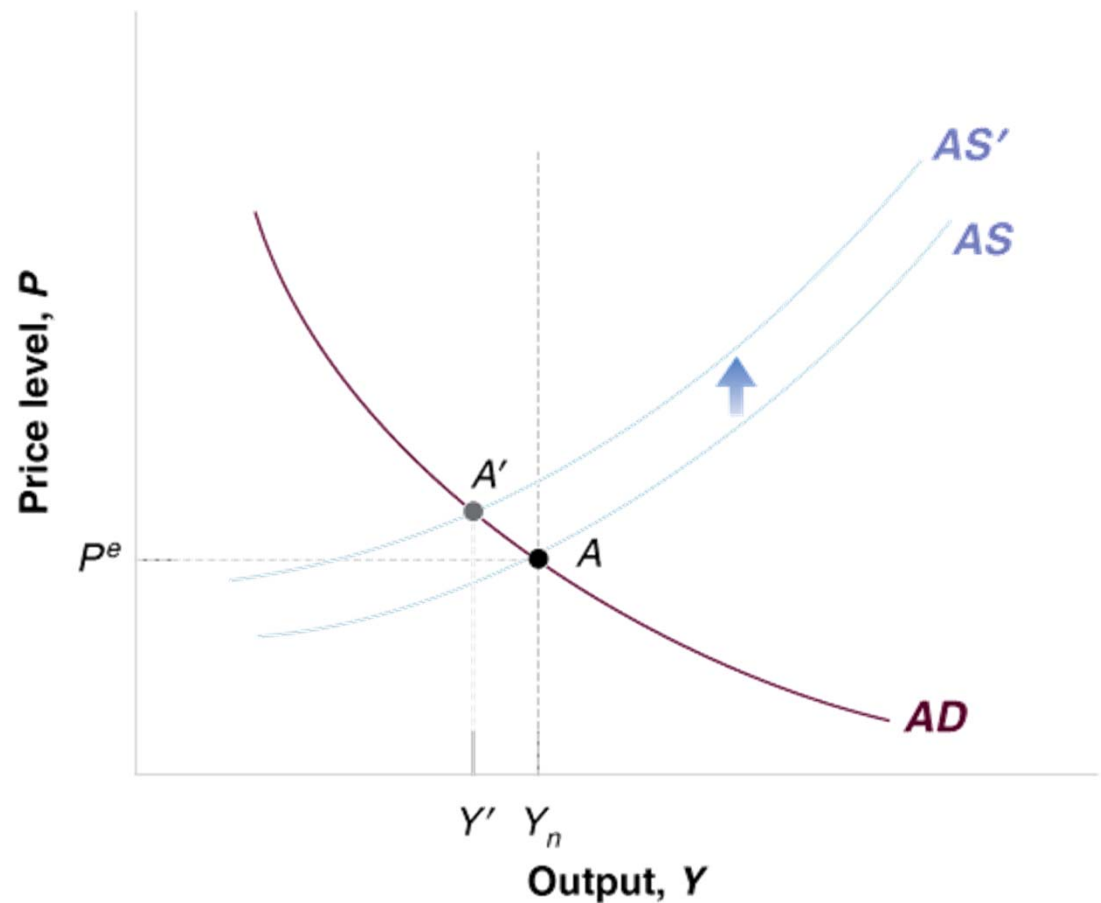
$$P = (1 + \mu)[P^e F(u, z)]^a P_E^{(1-a)}$$

- An increase in the price of energy results in an increase in the price level, at any level of output, Y . The aggregate supply curve shifts up.
- In addition, Y_n falls and u_n rises.

Changes in the Price of Oil

After the increase in the price of oil, the new AS curve goes through point B , where output equals the new lower natural level of output, Y'_n , and the price level equals P^e .

The economy moves along the AD curve, from A to A' . Output decreases from Y_n to Y' .

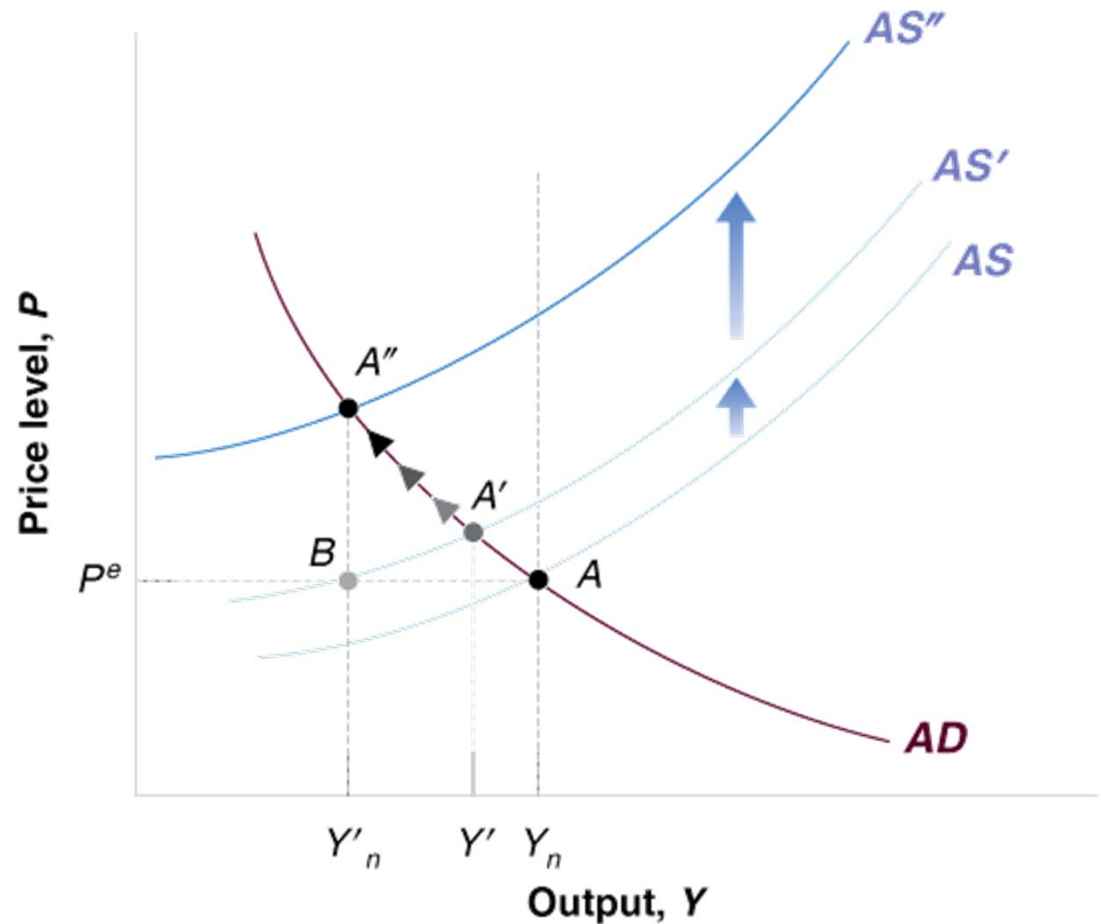


Changes in the Price of Oil

■ Figure 7 - 13

The Dynamic Effects of an Increase in the Price of Oil

An increase in the price of oil leads, in the short run, to a decrease in output and an increase in the price level. Over time, output decreases further, and the price level increases further.

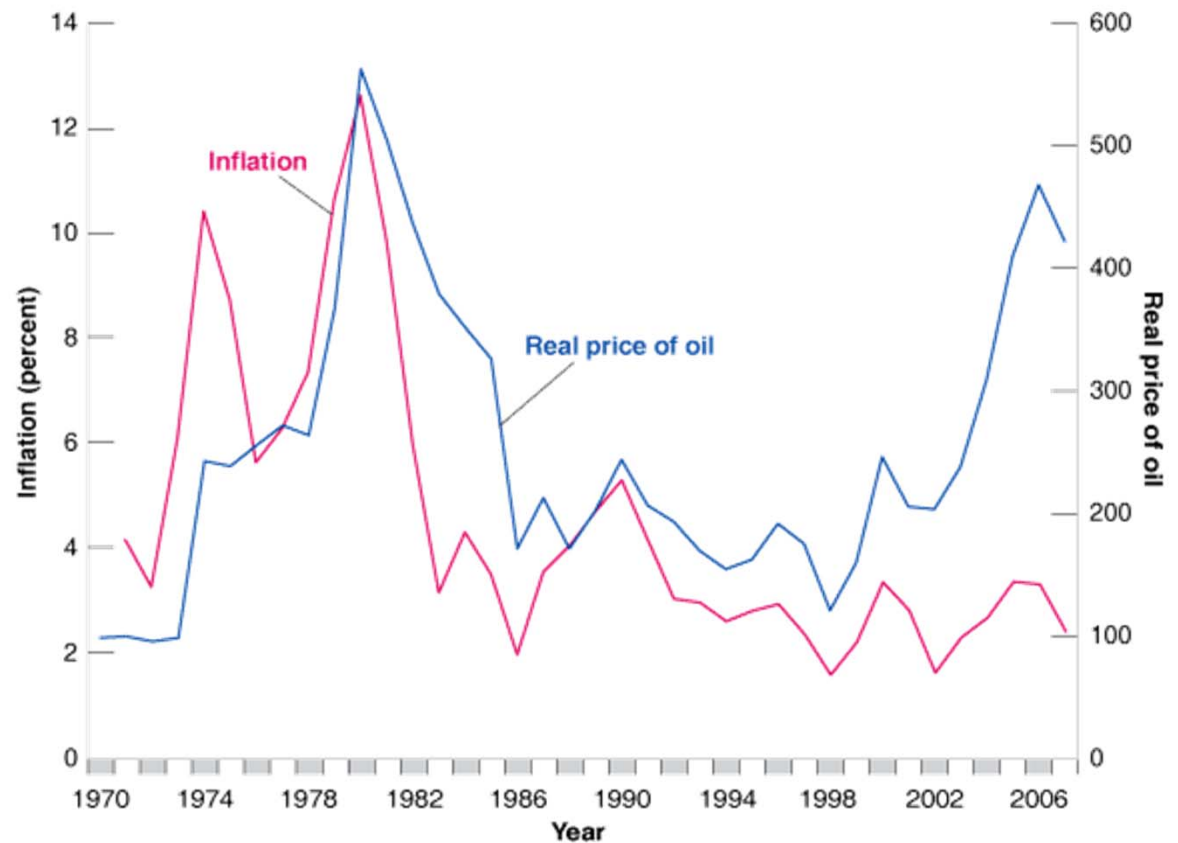


Changes in the Price of Oil

■ **Figure 7 - 14**

Oil Price Increases and Inflation in the United States Since 1970

The oil price increases of the 1970s were associated with large increases in inflation. But this has not been the case for the recent oil price increases.



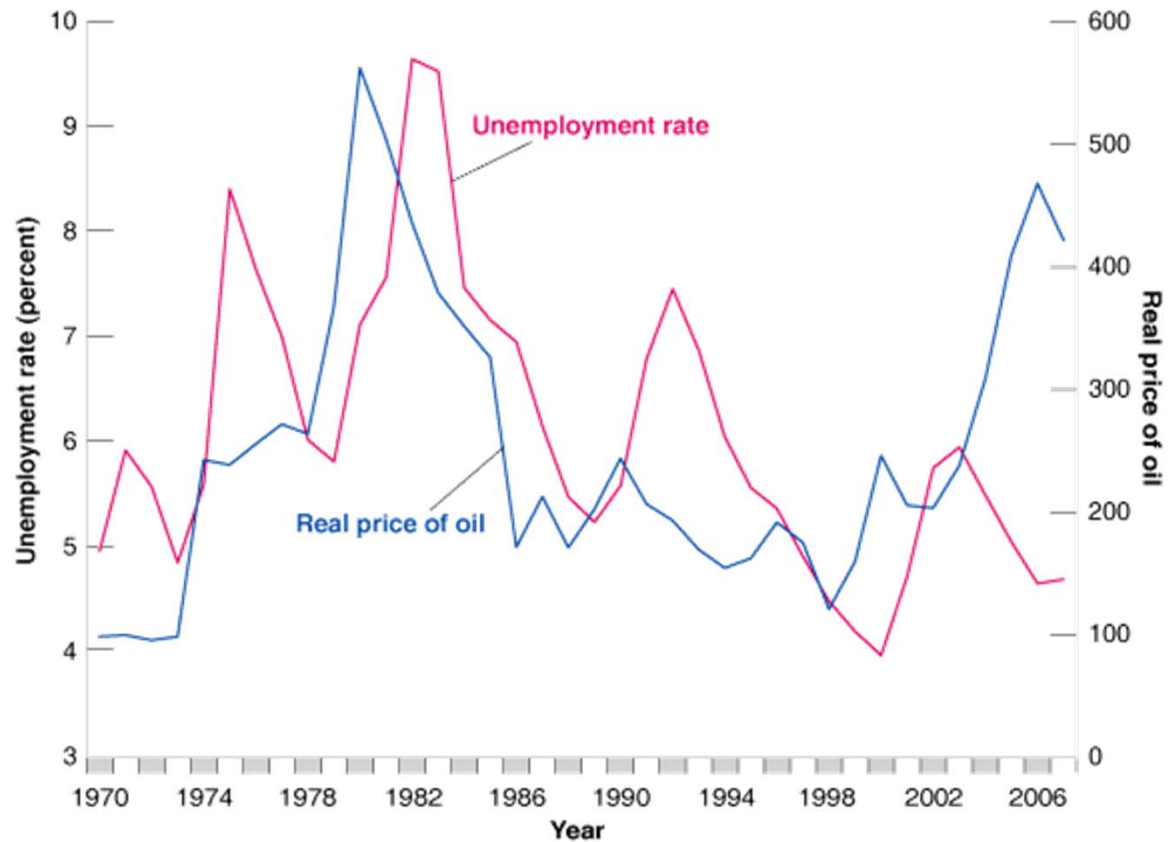
Changes in the Price of Oil

Effects on the Natural Rate of Unemployment

■ **Figure 7 - 15**

Oil Price Increases and Unemployment in the United States Since 1970

The oil price increases of the 1970s were associated with large increases in unemployment. But this has not been the case for the recent oil price increases.



Oil Price Increases: Why Are the 2000s So Different from the 1970s?

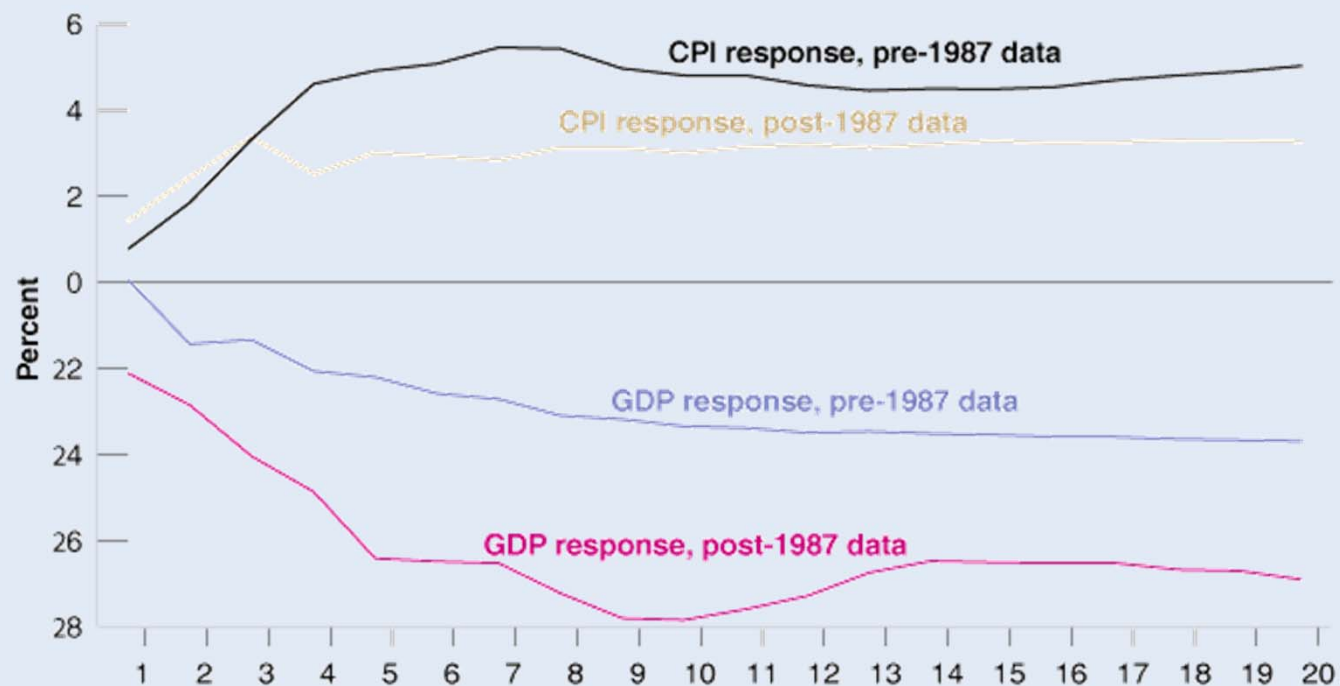


FOCUS

Figure 1

The Effects of a 100% Increase in the Price of Oil on the CPI and on GDP

The effects of an increase in the price of oil on output and the price level are much smaller than they used to be.



Summary

The Short Run Versus the Medium Run

Table 7-1 Short-Run Effects and Medium-Run Effects of a Monetary Expansion, a Budget Deficit Reduction, and an Increase in the Price of Oil on Output, the Interest Rate, and the Price Level

	<i>Short Run</i>			<i>Medium Run</i>		
	Output Level	Interest Rate	Price Level	Output Level	Interest Rate	Price Level
Monetary expansion	Increase	Decrease	Increase (small)	No change	No change	Increase
Deficit reduction	Decrease	Decrease	Decrease (small)	No change	Decrease	Decrease
Increase in oil price	Decrease	Increase	Increase	Decrease	Increase	Increase

Shocks and Propagation Mechanisms

Output fluctuations (sometimes called **business cycles**) are movements in output around its trend.

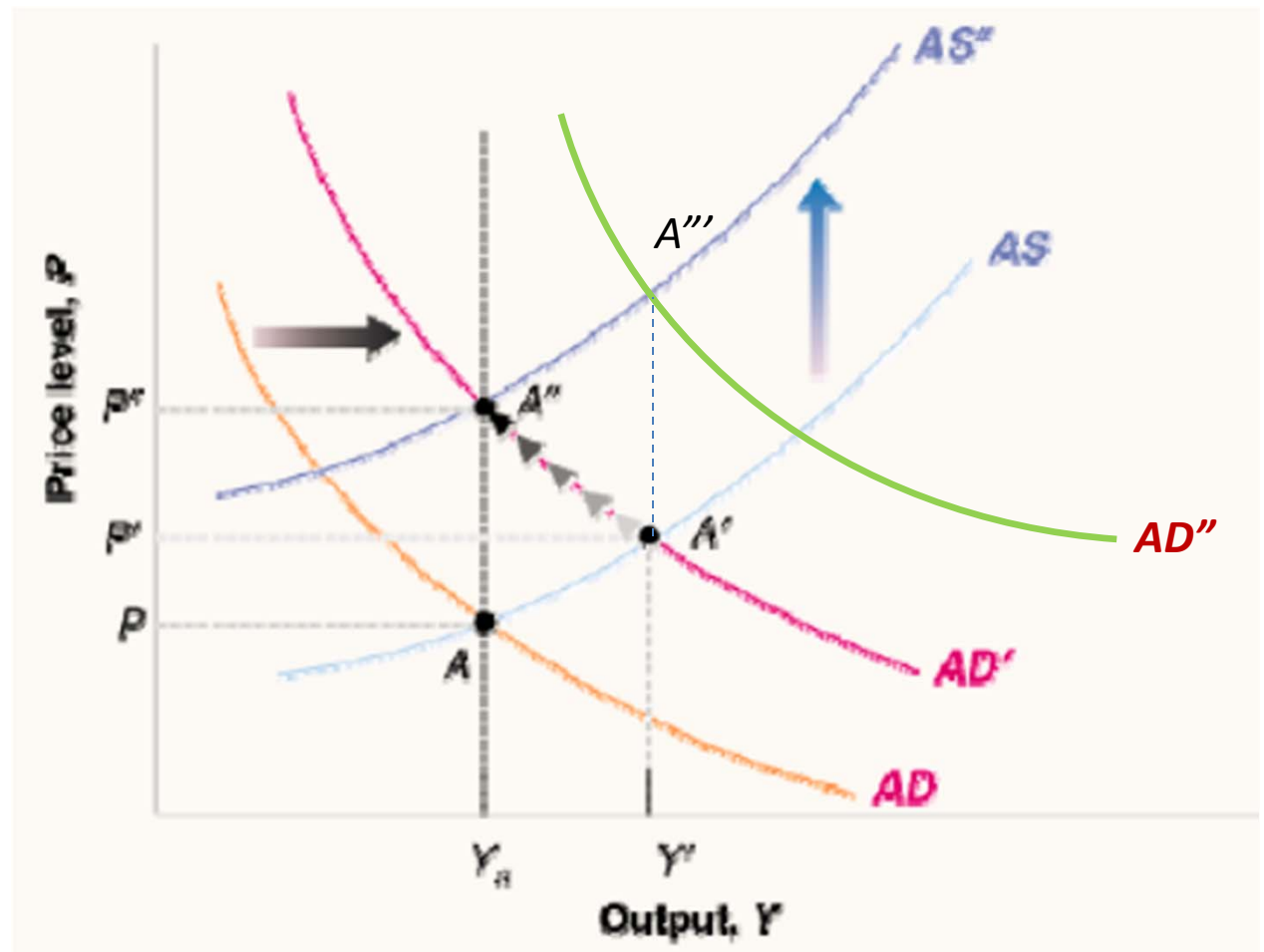
The economy is constantly hit by **shocks** to aggregate supply, or to aggregate demand, or to both.

Each shock has dynamic effects on output and its components. These dynamic effects are called the **propagation mechanism** of the shock.

Unsustainable Policies

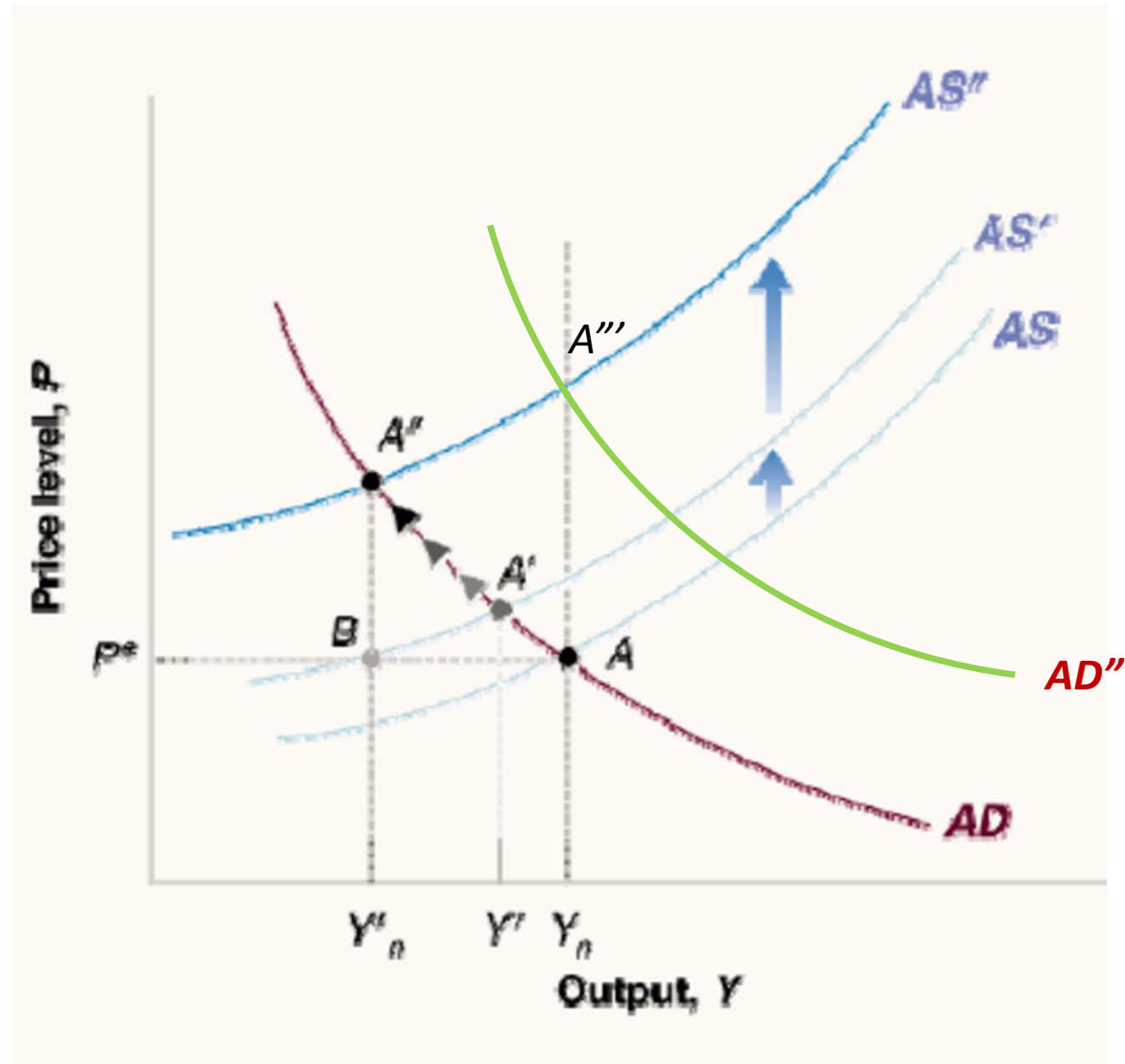
Unsustainable Policies? (I)

- Trying to keep output above Y_n indefinitely
- Shift to AD'' , go to pt A''' instead of A''
- Keeps output at Y' , but next period, AS shifts again to AS''
- Results in ever accelerating inflation if done by monetary policy



What Are Unsustainable Policies? (II)

- Trying to keep output above the *new* natural rate, Y''_n indefinitely
- Shift to AD'' , go to point A''' instead of A''
- Keeps output at Y' , but results in ever accelerating inflation



Yet *More* Unsustainable Policies

Yet *More* Unsustainable Policies

- The only cost of trying to keep output above Y_n is higher price level
- This relies upon assumption of adaptive expectations on *price level*

$$P^e = P_{-1}$$

- What if we assume adaptive expectations on *inflation*:

$$P^e = (1 + \pi^e)P_{-1}$$

$$P^e = (1 + \pi_{-1})P_{-1}$$

Yet *More* Unsustainable Policies

- This means the AS curve looks like the following:

$$P = \underbrace{(1 + \pi_{-1})P_{-1}}_{p^e} (1 + \mu) F \left(\left[1 - \frac{Y}{L} \right], z \right)$$

- The AS curve will tend to overshoot whenever output deviates from the natural rate.
- The AS curve will accelerate upwards if you try to keep output above Y_n indefinitely
- So the cost is accelerating inflation